

# Concrete Step Barrier Design Guidance

## CSB: Working Width and Set-Back

DRAWINGS CSB/501



### Design Guidance Notes

Working width and set-back are the key parameters used to determine safety barrier layouts.

### Working Width

Working width is defined as the distance between the barrier side facing the traffic before impact of the road restraint system and the maximum dynamic lateral position of any major part of the system<sup>1</sup>, as illustrated in Figure 1.



Dynamic deflection (D) and working width (W) for CSB

The working width is therefore a function of both the deflection behaviour of the safety barrier under impact and the overhang of the test vehicle. In the case of the standard profile CSB, the barrier is non-deformable, so the working width is obtained solely from the test vehicle overhang.

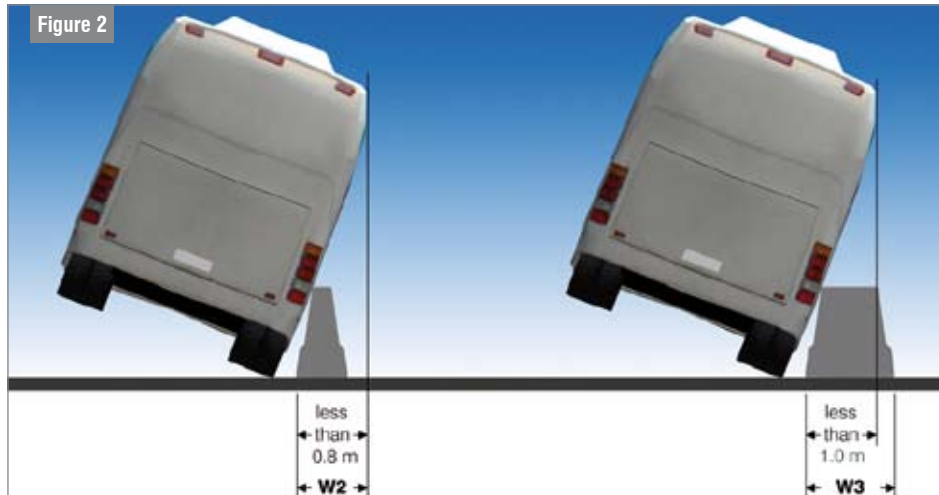
Table 1: Approved working width classes for CSB profiles.	Profile	Contaminated performance class	Working width class
	CSB	N2	W1
	CSB	H2	W2
	WCSB	H2	W3
	VCSB	H2	W2
	WVCSB	H2	W3

The standard profile CSB is classified as having a working width of W2, i.e.  $W < 0.8$  m. The working width classes for step barrier profiles are given in Table 1.

<sup>1</sup> BS EN 1317-2: Road Restraint Systems  
Part 2: Performance classes, impact test acceptance criteria and test methods for safety barriers

<sup>2</sup> TD 27 Cross-Sections and Headroom

<sup>3</sup> TD 19 Requirement for Road Restraint Systems



Working width classes for CSB and WCSB

For the wide CSB profile (WCSB), the physical width of the base of the barrier is included in the determination of working width thereby increasing the working width class to W3. It should be noted that this does not mean the barrier will deform, or that the test vehicle overhangs to any greater extent than for the standard profile barrier (Figure 2).

For locally widened sections (eg dual barrier with infill and bifurcations), it may be more appropriate to consider the barrier as two single sided barriers constructed back-to-back, rather than as a double-sided barrier, for the purposes of working width and set-back.

When the WCSB is used incorporating lighting columns mounted on top of the barrier (see Figure 3), it is permitted by the HA that these columns are located within the designated working width.

### Set-Back

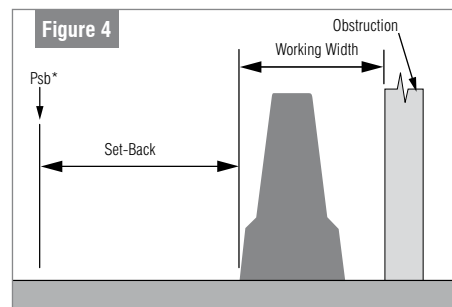
Set-back should be determined in accordance with TD 27<sup>2</sup>. Set-back is measured from the same point on the CSB traffic face as the working width (Figure 4).

It is preferable that kerbs are not positioned in front of the CSB as they could tend to destabilise a vehicle prior to impact with the barrier. Where kerbs on the traffic side of a barrier are unavoidable, their dimensions and their position relative to the barrier should conform with the requirements in [Data Sheet DS/CSB/524](#).

Additional care should be taken when determining set-back at bifurcations, tapers and sections of local widening ([Data Sheets DS/CSB/507-509](#)).

### Layout Adjacent to Obstructions

The layout of the CSB adjacent to obstructions should be determined in accordance with TD 19<sup>3</sup>.



Set-Back and working width for CSB (single sided application)

The length of dual barrier required on the approach to, and departure from, protected obstructions should be determined in accordance with TD 19. It is recommended that this is considered on a project specific basis to enable a cost-effective layout to be achieved.

Particular recommendations for the interface between CSB and gantry bases or impact resistant bridge piers are given on [Data Sheet DS/CSB/509](#).

#### Note:

Standards referenced above are applicable to the UK. For other locations refer to equivalent national standards.



Lighting Column mounted on TWCSB